

**WHAT IS CLAIMED IS:**

1. A method for peeling off a semiconductor element comprising:  
forming over a substrate a first base layer having a plurality of recessed portions;  
5 forming on the first base layer a second base layer having a plurality of voids over a plurality of the recessed portions;  
forming a third base layer over the second base layer;  
forming a semiconductor element over the third base layer; and  
separating the second base layer at an intersecting surface with a plurality of the voids,  
10 thereby peeling off the semiconductor element from the substrate.
  
2. A method for peeling off a semiconductor element comprising:  
forming over a substrate a first base layer having a plurality of recessed portions;  
forming on the first base layer a second base layer having a plurality of voids over a  
15 plurality of the recessed portions;  
forming a third base layer over the second base layer;  
forming a semiconductor element over the third base layer;  
forming an opening portion which extends to a part of each of a plurality of the voids;  
and  
20 enlarging each of a plurality of the voids by diffusing an etchant into each of a plurality of the voids from the opening portion, and separating the second base layer at an intersecting surface with a plurality of the voids, thereby peeling off the semiconductor element from the substrate.
  
- 25 3. A method for peeling off a semiconductor element comprising:  
forming over a substrate a first base layer having a plurality of recessed portions;  
forming on the first base layer a second base layer having a plurality of voids over a plurality of the recessed portions;  
polishing a surface of the second base layer;  
30 forming a third base layer over the second base layer whose surface is polished;

forming a semiconductor element over the third base layer; and  
separating the second base layer at an intersecting surface with a plurality of the voids,  
thereby peeling off the semiconductor element from the substrate.

5        4. A method for peeling off a semiconductor element comprising:  
            forming over a substrate a first base layer having a plurality of recessed portions;  
            forming on the first base layer a second base layer having a plurality of voids over a  
plurality of the recessed portions;  
            polishing a surface of the second base layer;  
10        forming a third base layer over the second base layer whose surface is polished;  
            forming a semiconductor element over the third base layer; and  
            separating the second base layer with the first base layer at an intersecting surface  
with a plurality of the voids, thereby peeling off the semiconductor element from the substrate.

15        5. A method for peeling off a semiconductor element comprising:  
            forming over a first substrate a first base layer having a plurality of recessed portions;  
            forming on the first base layer a second base layer having a plurality of voids over a  
plurality of the recessed portions;  
            polishing a surface of the second base layer;  
20        forming a third base layer over the second base layer whose surface is polished;  
            forming a semiconductor element over the third base layer;  
            forming a protective layer so as to cover the semiconductor element;  
            attaching a second substrate to the protective layer and attaching a third substrate to  
the first substrate; and  
25        separating the second base layer at an intersecting surface with a plurality of the voids,  
thereby peeling off the semiconductor element and the second substrate from the first substrate  
and the third substrate.

30        6. A method for peeling off a semiconductor element comprising:  
            forming over a first substrate a first base layer having a plurality of recessed portions;

forming on the first base layer a second base layer having a plurality of voids over a plurality of the recessed portions;

polishing a surface of the second base layer;

forming a third base layer over the second base layer whose surface is polished;

5 forming a semiconductor element over the third base layer;

forming a protective layer so as to cover the semiconductor element;

attaching a second substrate to the protective layer and attaching a third substrate to the first substrate; and

separating the second base layer with the first base layer at an intersecting surface

10 with a plurality of the voids, thereby peeling off the semiconductor element and the second substrate from the first substrate and the third substrate.

7. A method for peeling off a semiconductor element comprising:

forming over a substrate a first base layer having a plurality of recessed portions;

15 forming on the first base layer a second base layer having a plurality of voids over a plurality of the recessed portions;

polishing a surface of the second base layer;

forming a third base layer over the second base layer whose surface is polished;

forming a semiconductor element over the third base layer;

20 forming an opening portion which extends to a part of each of a plurality of the voids;

and

enlarging each of a plurality of the voids by diffusing an etchant into each of a plurality of the voids from the opening portion, and separating the second base layer at an intersecting surface with a plurality of the voids, thereby peeling off the semiconductor element

25 from the substrate.

8. A method for peeling off a semiconductor element comprising:

forming over a substrate a first base layer having a plurality of recessed portions;

forming on the first base layer a second base layer having a plurality of voids over a

30 plurality of the recessed portions;

polishing a surface of the second base layer;  
forming a third base layer over the second base layer whose surface is polished;  
forming a semiconductor element over the third base layer;  
forming an opening portion which extends to a part of each of a plurality of the voids;

5 and

enlarging each of a plurality of the voids by diffusing an etchant into each of a plurality of the voids from the opening portion, and separating the second base layer with the first base layer at an intersecting surface with a plurality of the voids, thereby peeling off the semiconductor element from the substrate.

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9. A method for peeling off a semiconductor element comprising:

forming over a first substrate a first base layer having a plurality of recessed portions;  
forming on the first base layer a second base layer having a plurality of voids over a plurality of the recessed portions;

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polishing a surface of the second base layer;

forming a third base layer over the second base layer whose surface is polished;

forming a semiconductor element over the third base layer;

forming an opening portion which extends to a part of each of a plurality of the voids on a region that is not provided with the semiconductor element;

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forming a protective layer so as to cover the semiconductor element;

attaching a second substrate to the protective layer and attaching a third substrate to the first substrate; and

enlarging each of a plurality of the voids by diffusing an etchant into each of a plurality of the voids from the opening portion, and separating the second base layer at an intersecting surface with a plurality of the voids, thereby peeling off the semiconductor element and the second substrate from the first substrate and the third substrate.

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10. A method for peeling off a semiconductor element comprising:

forming over a first substrate a first base layer having a plurality of recessed portions;

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forming on the first base layer a second base layer having a plurality of voids over a

plurality of the recessed portions;

polishing a surface of the second base layer;

forming a third base layer over the second base layer whose surface is polished;

forming a semiconductor element over the third base layer;

5        forming an opening portion which extends to a part of each of a plurality of the voids on a region that is not provided with the semiconductor element;

forming a protective layer so as to cover the semiconductor element;

attaching a second substrate to the protective layer and attaching a third substrate to the first substrate; and

10      enlarging each of a plurality of the voids by diffusing an etchant into each of a plurality of the voids from the opening portion, and separating the second base layer with the first base layer at an intersecting surface with a plurality of the voids, thereby peeling off the semiconductor element and the second substrate from the first substrate and the third substrate.

15      11. A method for peeling off a semiconductor element comprising:

forming over a substrate a first base layer comprising a metal layer having a plurality of recessed portions and;

forming a metal oxide layer on a surface of the metal layer by oxidizing;

forming on the metal oxide layer a second base layer having a plurality of voids over

20      a plurality of the recessed portions;

polishing a surface of the second base layer;

forming a third base layer over the second base layer whose surface is polished;

forming a semiconductor element over the third base layer and crystallizing the metal oxide layer; and

25      separating the second base layer at an intersecting surface with a plurality of the voids and a part of the crystallized metal oxide layer, thereby peeling off the semiconductor element from the substrate.

12. A method for peeling off a semiconductor element comprising:

30      forming over a substrate a first base layer comprising a metal layer having a plurality

of recessed portions and;

forming a metal oxide layer on a surface of the metal layer by oxidizing;

forming on the metal oxide layer a second base layer having a plurality of voids over a plurality of the recessed portions;

5       polishing a surface of the second base layer;

forming a third base layer over the second base layer whose surface is polished;

forming a semiconductor element over the third base layer and crystallizing the metal oxide layer; and

separating the second base layer with the first base layer at an intersecting surface

10      with a plurality of the voids and a part of the crystallized metal oxide layer, thereby peeling off the semiconductor element from the substrate.

13. A method for peeling off a semiconductor element comprising:

forming over a first substrate a first base layer comprising a metal layer having a

15      plurality of recessed portions and;

forming a metal oxide layer on a surface of the metal layer by oxidizing;

forming on the metal oxide layer a second base layer having a plurality of voids over a plurality of the recessed portions;

polishing a surface of the second base layer;

20       forming a third base layer over the second base layer whose surface is polished;

forming a semiconductor element over the third base layer and crystallizing the metal oxide layer;

forming a protective layer so as to cover the semiconductor element;

attaching a second substrate to the protective layer and attaching a third substrate to

25      the first substrate; and

separating the second base layer at an intersecting surface with a plurality of the voids and a part of the crystallized metal oxide layer, thereby peeling off the semiconductor element and the second substrate from the first substrate and the third substrate.

30       14. A method for peeling off a semiconductor element comprising:

forming over a first substrate a first base layer comprising a metal layer having a plurality of recessed portions and;

forming a metal oxide layer on a surface of the metal layer by oxidizing;

forming on the metal oxide layer a second base layer having a plurality of voids over

5 a plurality of the recessed portions;

polishing a surface of the second base layer;

forming a third base layer over the second base layer whose surface is polished;

forming a semiconductor element over the third base layer and crystallizing the metal oxide layer;

10 forming a protective layer so as to cover the semiconductor element;

attaching a second substrate to the protective layer and attaching a third substrate to the first substrate; and

separating the second base layer with the first base layer at an intersecting surface with a plurality of the voids and a part of the crystallized metal oxide layer, thereby peeling off

15 the semiconductor element and the second substrate from the first substrate and the third substrate.

15. A method for manufacturing a semiconductor element comprising:

forming over a first substrate a first base layer having a plurality of recessed portions;

20 forming on the first base layer a second base layer having a plurality of voids over a plurality of the recessed portions;

forming a third base layer over the second base layer;

forming a semiconductor element over the third base layer;

separating the second base layer at an intersecting surface with a plurality of the voids,

25 thereby peeling off the semiconductor element from the first substrate; and

attaching the peeled semiconductor element to a second substrate.

16. A method for manufacturing a semiconductor element comprising:

forming over a first substrate a first base layer having a plurality of recessed portions;

30 forming on the first base layer a second base layer having a plurality of voids over a

plurality of the recessed portions;

polishing a surface of the second base layer;

forming a third base layer over the second base layer whose surface is polished;

forming a semiconductor element over the third base layer;

5        separating the second base layer at an intersecting surface with a plurality of the voids, thereby peeling off the semiconductor element from the first substrate; and

attaching the peeled semiconductor element to a second substrate.

17. A method for manufacturing a semiconductor element comprising:

10      forming over a first substrate a first base layer comprising a metal layer having a plurality of recessed portions and;

forming a metal oxide layer on a surface of the metal layer by oxidizing;

forming on the metal oxide layer a second base layer having a plurality of voids over a plurality of the recessed portions;

15      polishing a surface of the second base layer;

forming a third base layer over the second base layer whose surface is polished;

forming a semiconductor element over the third base layer and crystallizing the metal oxide layer;

separating the second base layer at an intersecting surface with a plurality of the voids

20      and a part of the crystallized metal oxide layer, thereby peeling off the semiconductor element from the first substrate; and

attaching the peeled semiconductor element to a second substrate.

18. A method for manufacturing a semiconductor element comprising:

25      forming over a first substrate a first base layer having a plurality of recessed portions;

forming on the first base layer a second base layer having a plurality of voids over a plurality of the recessed portions;

forming a third base layer over the second base layer;

forming a semiconductor element over the third base layer;

30      forming an opening portion which extends to a part of each of a plurality of the voids;

enlarging each of a plurality of the voids by diffusing an etchant into each of a plurality of the voids from the opening portion, and separating the second base layer at an intersecting surface with a plurality of the voids, thereby peeling off the semiconductor element from the first substrate; and

5       attaching the peeled semiconductor element to a second substrate.

19. A method for manufacturing a semiconductor element comprising:  
forming over a first substrate a first base layer having a plurality of recessed portions;  
forming on the first base layer a second base layer having a plurality of voids over a  
10      plurality of the recessed portions;

polishing a surface of the second base layer;  
forming a third base layer over the second base layer whose surface is polished;  
forming a semiconductor element over the third base layer;  
forming an opening portion which extends to a part of each of a plurality of the voids;  
15       enlarging each of a plurality of the voids by diffusing an etchant into each of a plurality of the voids from the opening portion, and separating the second base layer at an intersecting surface with a plurality of the voids, thereby peeling off the semiconductor element from the first substrate; and  
attaching the peeled semiconductor element to a second substrate.

20       20. A method for peeling off a semiconductor element according to claim 1, wherein the first base layer is formed of an insulating layer.

25       21. A method for peeling off a semiconductor element according to claim 2, wherein the first base layer is formed of an insulating layer.

22. A method for peeling off a semiconductor element according to claim 3, wherein the first base layer is formed of an insulating layer.

30       23. A method for peeling off a semiconductor element according to claim 4, wherein

the first base layer is formed of an insulating layer.

24. A method for peeling off a semiconductor element according to claim 5, wherein  
the first base layer is formed of an insulating layer.

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25. A method for peeling off a semiconductor element according to claim 6, wherein  
the first base layer is formed of an insulating layer.

26. A method for peeling off a semiconductor element according to claim 7, wherein  
10 the first base layer is formed of an insulating layer.

27. A method for peeling off a semiconductor element according to claim 8, wherein  
the first base layer is formed of an insulating layer.

15 28. A method for peeling off a semiconductor element according to claim 9, wherein  
the first base layer is formed of an insulating layer.

29. A method for peeling off a semiconductor element according to claim 10, wherein  
the first base layer is formed of an insulating layer.

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30. A method for peeling off a semiconductor element according to claim 3, wherein  
the polish is performed by CMP.

25 31. A method for peeling off a semiconductor element according to claim 4, wherein  
the polish is performed by CMP.

32. A method for peeling off a semiconductor element according to claim 5, wherein  
the polish is performed by CMP.

30 33. A method for peeling off a semiconductor element according to claim 6, wherein

the polish is performed by CMP.

34. A method for peeling off a semiconductor element according to claim 7, wherein  
the polish is performed by CMP.

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35. A method for peeling off a semiconductor element according to claim 8, wherein  
the polish is performed by CMP.

36. A method for peeling off a semiconductor element according to claim 9, wherein  
10 the polish is performed by CMP.

37. A method for peeling off a semiconductor element according to claim 10, wherein  
the polish is performed by CMP.

15 38. A method for peeling off a semiconductor element according to claim 11, wherein  
the polish is performed by CMP.

39. A method for peeling off a semiconductor element according to claim 12, wherein  
the polish is performed by CMP.

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40. A method for peeling off a semiconductor element according to claim 13, wherein  
the polish is performed by CMP.

41. A method for peeling off a semiconductor element according to claim 14, wherein  
25 the polish is performed by CMP.